KYOUNGMO KOO

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SUMMARY

- With extensive research and industrial experiences in firmware design, seeking an R&D position
- Conducted various academic embedded projects on firmware development using C and Python
- Developed a firmware-based Galvanometer controller utilized for affordable and precise medical scanning applications
- Designed an embedded system for electric motor-related development and prototyped on a FPGA using Verilog/VHDL

EDUCATION

University of Michigan, Ann Arbor, MI — Jun 2025 (Expected)
Master of Science in Electrical & Computer Engineering
- Cumulative GPA: 4.00/4.00
- Relevant Coursework: Linear System Theory, Nonlinear System & Control, Robotic Kinetic Dynamics

Seoul National University, Seoul, KR — 2023
Bachelor of Science in Electrical & Computer Engineering
- Cumulative GPA: 3.86/4.30
- Relevant Coursework: Design Project for Electrical Devices & Systems, Digital Logic Design, Digital Integrated Circuits, Semiconductor Devices, Signals and Systems, Introduction to Communications, Electromechanics

ENGINEERING SKILLS

- Programming Languages: **C, C++, Python, Verilog, VHDL for embedded system applications**
- Used Tools: Matlab, LTSPICE, HSPICE, PLECS, Simulink, Consol Multiphysics, Altium, KiCad
- Used Processors: STM32L476RG

WORK EXPERIENCES

BorgWarner Inc., Kokokmo, IN — May – Aug 2024
Embedded System Intern, e-Hardware Architecture Team
- Developed user interfaces (UIs) utilizing a keypad and OLED display connected to an FPGA board via the SPI bus.
- Integrated various functional blocks and enabled digital signal processing using Verilog/VHDL in the Vivado environment.
- Participated in designing a circuit prototype and PCB board to optimize signal performance for users.
- Defined system stability by analyzing various battery waveforms, current and temperature of an electric motor controller in time domain using multimeter, microprocessors, and digital data logger.

Image-Guided Medical Robotics Lab, University of Michigan, Ann Arbor, MI — Aug 2023 - Present
Research Assistant, Electical & Computer Engineering Group (Prof. Mark Draelos)
- Designed and developed a Galvanometer controller to enhance the quality of Optical Coherence Tomography (OCT) scan on an STM32L476RG board using C
- Implemented stable, real-time bidirectional communication operating at a 50 kHz frame rate, utilizing SPI, SAI, and UART
- Utilized Direct Memory Access (DMA) and callback functions for independent operation management

Michigan Autonomous Aerial Vehicles (MAAV), Ann Arbor, MI — Aug – Oct 2023
Firmware Developer, Embedded System Team, Student-led organization
- Participated in design of autonomous aerial vehicle for the International Aerial Robotics Competition (IARC)
- Designed PCBs with microprocessors and sensors using Altium and STM32 Cube IDE
- Acquired proficiency in microprocessor GPIOs and interfaces, enhancing communication protocols utilized in drone circuitry

Seoul National University, Seoul, KR 2021 – 2023
Research Intern, Applied Superconductivity Lab (Prof. Seungyong Hahn)
- Designed internal circuitry of superconductivity-applied electromechanical devices using MATLAB, LTSPICE, and COMSOL Multiphysics
- Conducted simulations and experimental studies on a no-insulation high-temperature superconductor (NI HTS) applied magnetohydrodynamic (MHD) ship – the world's first of its kind
- Proposed use cases for a 10kW-scale wave energy converter design incorporating NI HTS considering mechanical, thermal, and electromagnetic stability

Republic of Korea Army (ROKA), Yang-Pyeong, KR 2018 – 2020
Sergeant, Satellite Operation Specialist, Missile Strategic Command
- Established mobile satellite communication systems connecting front-line missile battalions with base stations

Snek, Seoul, KR Apr – Jun 2021
Marketing & Data Analyst Intern
- Conducted an in-depth analysis of spending patterns among premium users using Python to enhance the conversion rate
- Proposed a data-driven strategy for targeted Google advertisements, focusing on potential customers to create user traffic

Seoul National University: Growth Hackers, Seoul, KR 2020 –2021
Fellowship Workshop Head, Public Relations Group Head
- Conducted an educational program for over 20 selected underclassmen covering fundamental Python concepts and practical data analysis techniques
- Promoted Growth Hackers to external organizations by leveraging YouTube and LinkedIn platforms

Nrise, Seoul, KR Jan– Feb 2021
Marketing & Data Analyst Intern, Project Manager
- Optimized push message notifications by conducting user segmentation and customizing tailored messages
- Identified effective buzzwords on notifications by analyzing user click-rate using SQL and Python

Diveroid, Seoul, KR Oct 2020 – Jan 2021
Data Analyst Intern
- Developed a data-driven growth marketing strategy to optimize targeted advertising across various social media platforms
- Analyzed ad click-through rates to identify patterns of users and evaluated the marketing strategy's effectiveness

PUBLICATIONS

- "Design, Construction, and Operation of Liquid Nitrogen Cooled MHD Miniature Ship with No-Insulation High Temperature Superconductor Magnet", Kyoungmo Koo, Chaemin Im, Geonyoung Kim, Jaemin Kim, Seungyong Hahn, *IEEE Transactions on Transportation Electrification*, Accepted (paper)
- "Conceptual Design and Analysis of No-Insulation High- Temperature Superconductor Tubular Wave Energy Converter", Kyoungmo Koo, Wonseok Jang, Jeonghwan Park, Jaemyung Cha and Seungyong Hahn, *ArXiv* (paper)

HONORS

- The 3rd place from thesis competition, Korea Hydropower Industry Association (KHA) 2021
- Silicon Valley Entrepreneurship Fellowship, Stanford, CA Jun – Jul 2018

LANGUAGES

- English (Proficient), Korean (Native), Chinese (Limited)